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COMPARISON OF FOOD WASTE MANAGEMENT POLICES BETWEEN GREECE AND ARMENIA: POSSIBLE RECOMMENDATIONS FOR ARMENIA

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Abstract

The topic of food waste management has become a global discussion in recent years, but it is still not widely addressed in Greek and Armenian societies. This can be attributed to the common cultural and historical backgrounds of these countries. This study explores waste management practices in both countries, with a specific focus on their respective national frameworks and initiatives. The study critically discusses Greece's National Waste Prevention Programme (NWPP) and extrapolates key policies and strategies pertinent to the Armenian context. Moreover, the current geopolitical changes and their potential influence on the food waste management system of Armenia have been discussed. Cultural and historical backgrounds necessitate a comparative examination between these two nations' policies. Employing a comprehensive document analysis using a deductive, concept-driven approach facilitated by docAnalyzer.ai, this study identifies substantial deficiencies within existing policy documents. It underscores the need for enhanced education, increased investments, and strengthened collaborative efforts as significant factors crucial for effecting systemic transformation. Addressing these gaps through informed policy interventions can enable both governments to implement successful models of food waste management and foster circular economies adjusted with respective socio-economic landscapes.

Key words**:** *comparative policy analysis, food waste management, Greece, Armenia, policy gaps*

INTRODUCTION

Food waste and loss has deeply affected economy, environment quality and consumers' savings during the last decades. The amount of wastes food varies from a country to another depending in the specific circumstances [24].

Many researchers are focused on the analysis of waste situation looking for various solutions to diminish the amount of food losses [1, 24, 20, 21, 27, 30].

A variety of policies have been proposed to tackle food waste, emphasizing national strategic frameworks, legislative measures, food donation initiatives, waste recycling, public awareness and education, and systematic data collection (Abusin et al, 2020; Shen et al., 2023) [1, 26].

However, effective food waste management policies remain necessary in Greece and Armenia, where low recycling rates and the lack of a cohesive national food waste recycling system indicate significant gaps. Some European countries, such as France, already implemented an anti-waste law in 2016, which forbids large supermarkets from discarding or destroying unsold food. Instead, these retailers are mandated to donate the excess to charities and food banks. Noncompliance with this legislation can result in fines and imprisonment. This law is widely acknowledged as a crucial advancement in combating food waste (The Republic of France, 2016) [15].

Another successful example is Italy's law implemented in 2016, which encourages food donation and the use of the doggie bag at retail and restaurant levels through fiscal incentives and bureaucratic simplification. This law has proven to be effective in facilitating the redistribution of food waste, leading to Italy's improved ranking in the Food Sustainability Index from 9th position in 2016 to 4th position in 2017 (Food Sustainability Index, 2017) [14], (Italian

Republic, 2016) [18]. In this context, examining the food waste management policies of different countries can provide valuable insights. Greece and Armenia, two countries with a lot of common cultural, historical, and geopolitical backgrounds, present a unique opportunity for comparative analysis. A significant factor in my decision to undertake this research was my academic experience at the University of West Attica in Greece, where exposure to the country's cultural and socio-economic environment had a profound impact on my research interests. While Greece has made notable strides in developing comprehensive food waste management policies, Armenia continues to face significant challenges in this area. Understanding the similarities and differences between these countries' approaches can inform more effective policymaking in Armenia.

This research aims to answer following research questions.

RQ1: How do current Greek policies regulate food waste management, and how well it goes so far?

RQ2: What recommendations can be made for Armenia regarding food waste management policies to formulate a comprehensive and efficient national strategy?

MATERIALS AND METHODS

This study employs a comprehensive document analysis to investigate food waste management policies in Greece and the Republic of Armenia given their socio economic, political, cultural and historical familiarities. The analysis utilizes docAnalyzer.ai [5], a sophisticated tool designed to facilitate the extraction of relevant concepts from extensive policy documents. The primary data sources for this research include national policy documents, legislative texts, and official reports related to waste management from both Greece and Armenia. These documents were accessed through governmental websites, academic databases, and international environmental organizations. A deductive, concept-driven approach was adopted for the document analysis. The key concepts "food," "waste," and "management" were used as search terms within the docAnalyzer.ai platform to identify and extract pertinent information. This approach ensured a focused examination of the policies relevant to food waste management. Process of analysing included: Identification of key documents, data input into docAnalyzer.ai, Concept extraction and Thematic Analysis.

To ensure the reliability and validity of the findings, cross-referencing was conducted with secondary literature, including academic papers and expert reports on waste management. Additionally, expert consultations were held to validate the interpretations derived from the document analysis. While docAnalyzer.ai provided a robust framework for identifying key concepts, the analysis was limited to the quality and comprehensiveness of the input documents. Furthermore, the deductive approach may have overlooked emerging themes not captured by the predefined key concepts.

RESULTS AND DISCUSSIONS

Food waste is gaining increasing attention in Western politics, with countries in the European Union, including Greece, becoming more proactive in measuring and regulating it. On May 3, 2019, the Commission Delegated Decision (EU) 2019/1597 [6] was adopted, supplementing Directive 2008/98/EC of the European Parliament and of the Council. This decision establishes a common methodology and minimum quality requirements for the uniform measurement of food waste levels. (European Commission, 2019) [6].

In 2022, the EU food waste amount accounted for 59 million tons, of which 54%, meaning 32 million tons, was produced by households.

In average, each European carries out 132 kg food waste per year, of which 72 kg are produced at home.

The top 10 EU member states with the highest amount of food wastes are presented in Table 1.

Table 1. Top 10 EU countries producing food wastes at home

	Food waste (Thousand tons)	Market share (%)
EU-27	32,000	100.0
1. Germany	6,289	19.6
2.Italy	5,905	18.5
3.France	3,944	12.3
4.Poland	2,528	7.9
5.Spain	1,434	4.5
6.Portugal	1,284	4.0
7.Greece	**914**	**2.8**
8.Netherlands	848	2.6
9.Belgium	751	2.3
10.Czechia	652	2.0
All 10	24.549	76.7

Source: Own calculations based on the data from Eurostat, 2022 [13, 3].

Germany is the top producer of wastes having a share of 19.6% in the EU waste amount. On the 2nd position comes Italy with 18.5%, then France with 12.3%, Poland with 7.9%, Spain with 4.5, Portugal with 4%.

Greece is situated on the 7th position producing over 914 thousand tons wastes from households, meaning 2.8%.

The country is followed by Netherlands with 2.6%, Belgium with 2.3% and Czechia with 2%.

However, if we consider the waste produced at home per inhabitant in the EU-27, the countries which occupy the top positions are: Portugal 123 kg/capita, Italy 100 kg and Malta 88 kg.

If we take into account the whole amount of wastes, Eurostat data reveals that Greece's annual per capita food waste is 191 kilograms, surpassing the EU average and ranking as the fourth highest in the European Union (Figure 1).

In 2016, Greece's circular use of materials was 2.4%, which increased to 5.4% by 2020. Despite this growth, the country still lags the EU average of 12.8% for this metric. (Eurostat, 2020) [12].

Greece has taken a positive step by streamlining environmental assessments under various EU directives. However, weak administrative capacity remains a significant challenge. EU funding supports bridging this gap, with Greece receiving over EUR 30 billion from its RRP (2021-2026) and EUR 20 billion from cohesion policy (2021-2027).

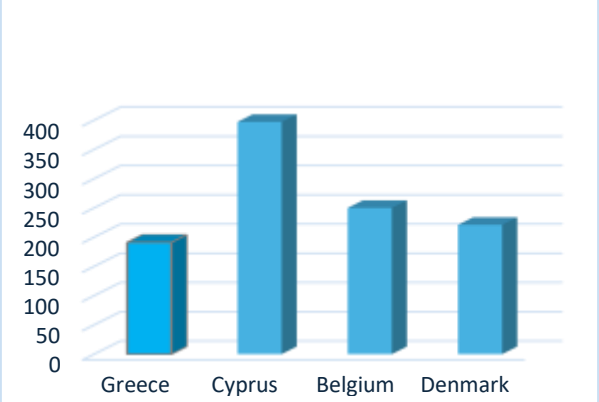

Fig. 1. Average annual food waste amounts per capita in Greece compared to other EU countries (kg)
Source: Eurostat, 2020 [12].

The Greek RRP aims to establish new regulatory authorities in the waste and water sectors, which should positively impact these areas. From 2014-2020, Greece's environmental investments were 0.72% of GDP, relying on EU and national funds. The estimated need for 2021-2027 is over 1.12% of GDP, indicating a financing gap of at least 0.4%. Issues persist with absorbing EU funds, especially in waste management and nature protection. Since 2014, Greece has paid over EUR 184 million in fines for EU waste and urban wastewater violations (European Commission, 2022) [7].

Fig. 2. Strategy for minimizing the environmental impact of food waste
Source: [29].

Figure 2, a custom illustration based on the US Environmental Protection Agency report, demonstrates strategies for minimizing the

environmental impact of food waste by identifying preferred and less preferred activities.

The Greek National Waste Prevention Programme (NWPP) spanning 2021-2030 [10] targets a 30% reduction in per capita food waste by 2030 compared to 2022 levels. The initiative encompasses strategies to minimize food losses across the production and supply chain. Key stakeholders participating in the NWPP include households, businesses, producers, economic operators, and citizens/consumers. The programme outlines sector-specific measures for primary production, processing and manufacturing, retail and distribution, catering and restaurants, and households within the food supply chain (European Environment Agency 2023, p.7) [9].

The National Waste Prevention Programme (NWPP) is developing a targeted food waste prevention programme aligned with the national circular economy action plan and roadmap spanning 2021–2025 [10]. This initiative includes specific measures to achieve a 30% reduction target, and involves formulating, implementing, and monitoring the programme. The NWPP also mandates the creation of an electronic platform where obligated entities must annually submit relevant data starting in 2022, aimed at monitoring food waste and donated food surpluses.

Furthermore, the NWPP supports the 'Alliance for the Reduction of Food Waste', a national initiative launched in 2020 by Boroume and AB Vassilopoulos [4]. This alliance engages key stakeholders across the food supply chain in collaborative efforts toward food waste prevention (European Environment Agency, 2023) [9].

The European Environmental Agency published an early warning assessment regarding the 2025 targets for municipal and packaging waste. This report included a thorough evaluation of Greece's progress in achieving its 2025 recycling goals for these waste categories. It highlights both success factors and risks related to achieving these targets. Key points include:

1.Separate collection system: Greece's existing system for separate bio-waste collection is quite limited, primarily collecting only garden waste in urban and suburban areas. In rural regions, there is no provision for separate biowaste collection. (European Environment Agency, 2022, p. 21) [9].

As of mid-2024, the universal collection of bio-waste has not yet been implemented, despite plans for municipalities to establish it by the end of 2022. This initiative also aimed to extend the obligation for separate collection to non-household waste. (European Environment Agency 2022, p. 23, p. 47) [9].

2. Extended producer responsibility (EPR): **As of mid-2024, the** regulations mandating separate biowaste collection by catering companies, initially set for implementation by the end of 2022, have not been enacted. These regulations, part of the Extended Producer Responsibility (EPR) framework, require food producers to manage their waste. Additionally, starting in 2023, food processing and manufacturing companies, vegetable markets, supermarkets, and hotels with over 100 beds were also supposed to comply with these requirements. (European Environment Agency 2022, p. 23) [9].

3.Economic Instruments: The landfill fee, set at 20 EUR per ton starting from 2022, is an economic tool designed to discourage landfilling by making it more costly, thus promoting alternative waste management practices such as composting. (European Environment Agency 2022, p. 34) [9].

While the current biowaste treatment capacity is inadequate, there are plans to expand it. This expansion likely involves investing in composting and other bio-waste treatment facilities to divert waste from landfills and enhance resource recovery (European Environment Agency 2022, p. 47) [9].

The report highlights Greece's challenges in meeting recycling targets for packaging and municipal solid waste (MSW). Greece risks not achieving the 65% recycling target for packaging waste by 2025, with the current recycling rate at 52.9%, 12.1 percentage points below the target. Similarly, the country faces difficulties in meeting the 55% MSW recycling target by 2025, as the recycling rate

was only 21% in 2019, significantly below the goal. The report notes a modest increase of 5.3 percentage points since 2015. For landfilling of municipal waste, a preliminary assessment indicates potential issues, with the official early warning assessment due in 2032 (European Environment Agency, 2022) [9].

The legislative framework for waste management in Greece is not only crucial for national and European Union compliance but also attracts attention from international investors, including the United States. Recent and upcoming legislative changes create a favourable environment for future investments in the country. Significant projects funded by the Operational Program 'Transport Infrastructures - Environment and Sustainable Development 2014-2020' involve the establishment and operation of Solid Waste Treatment units. These projects receive funding from Greek Solid Waste Management Agencies, local municipalities, European funds, and other sources. Key Greek companies such as GEK Terna, Helektor, AVAX, Intrakat, Mytilineos, Messogeios, Thalis, and Watt are actively involved. These initiatives represent a total investment of approximately €1,345 million, aimed at enhancing solid waste treatment infrastructure and capacity across Greece. (International Trade Administration U.S. Department of Commerce, 2023) [17].

Analysing the current Greek National Waste Prevention Programme (NWPP)

This paper describes the National Waste Prevention Programme (NWPP) for the period 2021-2030 of Greece, which seeks to foster a reduction in raw material consumption and transform consumer behaviour to gradually decrease waste generation. It outlines ambitious objectives, including a targeted 30% reduction in per capita food waste by 2030 compared to 2022 levels, alongside substantial cuts in single-use plastic consumption over the coming years. Encompassing a wide array of sectors such as primary food production, manufacturing, retail, catering, and construction, the NWPP prioritizes managing various waste types, including food, paper, packaging, plastics, electronics, textiles, and industrial and construction waste. The programme aims to engage diverse stakeholders ranging from households to businesses, economic operators, and consumers in a concerted effort to promote sustainable practices. Measures include incentivizing food donation and redistribution, advocating for building renovation over demolition, fostering innovation in waste-reducing technologies, promoting circular consumption patterns, and enhancing public awareness. To monitor progress and effectiveness, the Ministry of Environment and Energy will oversee the evaluation of programme outcomes. Implementation will involve establishing monitoring systems for food waste production, defining criteria for food donation suitability, promoting the establishment of nationwide repair canters for electronic equipment, and facilitating networks for the exchange and sale of used electronics. These initiatives underscore Greece's commitment to advancing sustainability goals and improving waste management practices across the nation. The Greek National Waste Prevention Programme focuses primarily on the environmental and social advantages of food waste reduction, while also addressing its economic dimensions.

Economic aspects:

-Financial incentives for food donation: Tax incentives for food donation have been introduced to incentivize businesses to donate excess food, thereby potentially lowering their operational costs. Specifically, the document outlines a provision (article 21 of law 4819/2021 (Hellenic Parliament, 2021) [16]) that proposes a 20% reduction in taxes for food donations, highlighting a deliberate effort to stimulate food donation through financial incentives. It also highlights the importance of leveraging funding for food waste reduction, mentioning the National Strategic Reference Framework and LIFE+ as examples. Moreover, it proposes establishing economic incentives for food donation, indicating the potential for investment in Greece.

-Increased business competitiveness: by maximizing waste valorisation and reducing

waste exports can contribute to increasing business competitiveness.

-Boosting repair services and purchase second hand products: highlights that providing financial incentives, such as reduced VAT and tax exemptions, can boost repair services and the purchase of second-hand products.

Social aspects:

-NGO initiatives: The "Alliance for the Reduction of Food Waste," initiated by the Boroume organization and AB Vassilopoulos [24], unites a diverse range of stakeholders, encompassing professional and industry associations, companies spanning the food supply chain, civil society organizations, and the academic and research sectors (European Environment Agency, 2023, p. 28) [9]. The document underscores the voluntary nature of this collaboration, highlighting the commitment of approximately 35 stakeholders who have signed onto the cooperative agreement within the alliance.

-Food donations: "Social Grocery" stores in Athens, donate a variety of products, including groceries, food, water, and household items, to families facing serious financial problems. In addition to environmental benefits, these initiatives contribute to supporting vulnerable social groups.

-Environmental aspect:

-Climate change: Food waste contributes significantly to achieving the United Nations Sustainable Development Goal of reducing global food waste by 50% per capita at the retail and consumer levels, as well as minimizing food losses throughout production and supply chains by 2030.

This reduction targets the environmental impact of food waste, focusing on its detrimental effects on climate change and resource depletion. Thus, addressing food waste not only aligns with global sustainability goals but also mitigates its adverse environmental consequences, particularly its role in exacerbating climate change and depleting vital resources

The document, while outlining the National Waste Prevention Programme's ambitious targets, does not explicitly address potential barriers or challenges that may hinder their full achievement. However, it does underscore the necessity of further examining constraints related to food donation, which could potentially impede progress. Moreover, the document discusses the introduction of economic incentives for food donation, hinting at possible funding gaps or implementation difficulties that might present obstacles to effective execution. Additionally, the document emphasizes the critical role of public awareness and behavioural change in achieving programme objectives. It stresses the importance of informing and educating households and the catering sector about altering food consumption and management practices, indicating that insufficient public engagement could pose a significant challenge.

Current Legislative Framework Addressing Food Waste in the Republic of Armenia

The Law of the Republic of Armenia, adopted on June 23, 2011 "On Garbage Removal and Sanitation" [23] defines the subject of the regulation of the law, which is the relationship with garbage collection and sanitation, defines the principles of organization of the garbage collection and sanitation process, the fee for garbage collection, its rates, the range of payers, their rights and responsibilities, payment procedure, responsibility for non-payment, non-fulfillment of obligations or improper fulfillment, the procedure for exercising the powers of local self-government bodies, the organization of garbage collection and sanitation (National Assembly of the Republic of Armenia, 2011)[23]. The current law does not mandate waste sorting at the household, enterprise, or food facility levels. Moreover, the Republic of Armenia has yet to establish a unified central system for processing biodegradable waste. The Republic of Armenia Law on Wastes governs the legal and economic aspects of waste collection, transportation, storage, processing, utilization, disposal, and volume reduction. It also addresses related activities and aims to prevent negative impacts on human health and the environment (National Assembly of the Republic of Armenia, 2004) [22]. A report on waste governance in Armenia made in 2020 identifies several gaps

in the current "Waste" law and calls for significant transformations. Notably, the concept of waste hierarchy is absent, despite the law promoting its components. The law lacks a clear sequence of priorities essential for the waste hierarchy approach. It also omits definitions for key terms such as biological waste including Food waste, waste manager, separate collection, high-quality recycling, low-quality recycling, intermediary, and reseller. Additionally, the circular economy and types of materials subject to processing are not defined. To comply with the CEPA ('Comprehensive and Extended Partnership Agreement between Republic of Armenia and EU', 2021) [28] on preparing waste management plans according to the five-step waste hierarchy and waste prevention programs, the term waste hierarchy needs to be included in the law While the law promotes "zero waste," "less waste," and resource-efficient technologies, it fails to emphasize the importance of promoting zero waste and less waste-generating consumption. Waste sorting, crucial for efficient material use, is also not sufficiently promoted. Furthermore, although Article 23 of the Law on Waste (National Assembly of the Republic of Armenia, 2004) [22] offers incentives for organizations to implement waste reduction technologies, there is no legal act outlining the application and receipt process for these benefits. (Alpetyan Harutyun et al. 2020, p. 56) [2] .

Unlike Greece, the Republic of Armenia currently lacks a comprehensive National Vision on Food Waste Management and the Implementation of a Circular Economy. Should Armenia pursue membership in the European Union, it will be crucial for Yerevan to initiate reforms in sustainable development and effective waste management. During a speech at the European Parliament on October 17, 2023, the Prime Minister of Armenia emphasized the country's readiness to align closely with the European Union to the extent that the EU deems possible. (*RFE/RL's Armenian service*, 2023) [25]. This declaration was followed by a special resolution from the European Council on EU-Armenia relations, which suggested considering Armenia's candidacy for EU membership. These developments indicate that food waste management in Armenia could gain significantly more attention. (European Parliament, 2024) [11]. Another indication of potential changes in food waste management and circular economy models over the next four years stems from a press statement by European Commission President von der Leyen. The statement outlined a Resilience and Growth Plan for Armenia, which includes an investment of 270 million EUR aimed at enhancing the robustness and resilience of the Armenian economy and society (European Commission, 2024) [8].

Analyzing the implementation report of Yerevan city development for 2023, published in spring 2024, reveals that collaboration with several European partner capitals has facilitated an increase in waste collection sites. However, a notable omission in the report is the lack of emphasis on the collection of food waste, its volumes, or its integration into circular economy models. The report indicates that approximately 28 tons of plastic, 30 tons of glass, and 580 tons of cardboard were collected through recyclable waste sorting. Under the "Cooperation of Yerevan, Warsaw, Tirana Capitals on the Common Challenges of Hazardous Waste Management" program, around 1,000 waste bins were donated. In 2024, 2,024 additional waste bins will be placed throughout Yerevan, doubling the number of existing addresses and enhancing waste collection efforts. (Yerevan Municipality, 2024) [31]. The fall of 2019 saw the Yerevan Municipality initiate a small-scale composting pilot program. This program aims to manage and process organic waste from gardens, street trees, and parks. There are also plans to include organic kitchen waste, which will be separately collected from public institutions such as kindergartens, schools, and universities. However, the main action plan of Yerevan Municipality still lacks a comprehensive model for food waste or bio-waste collection and management (Alpetyan Harutyun et al. 2020, p. 103) [2]. A recent research paper has called on the Armenian government to introduce green and circular public procurement processes, particularly in the food industry and catering sectors within

public institutions such as kindergartens, hospitals, and elderly homes. It also advocates for the establishment of a dedicated fund for circular economy projects, in close collaboration with financial institutions, NGOs, and public authorities (Markosyan and Aleksanyan, 2023) [19].

CONCLUSIONS

Analyzing Greece's National Waste Prevention Plan for 2021-2030 [10] reveals that waste control mechanisms and their implementation are prioritized at the state level. However, numerous challenges remain, and more time is needed to achieve specific targets. Non-governmental organizations, particularly Boroume, play a crucial role in managing food waste through close collaboration with the government, leading to the development and implementation of effective waste reduction laws. Nevertheless, Greece cannot solely depend on public structures, it requires mechanisms for leveraging successful experiences, investments, and scientific research to achieve rapid and effective progress in this field. As a member of the European Union, Greece has the necessary prerequisites to undertake these actions.

For the Republic of Armenia, following recommendations were made, exercising best practices of Greece, and opportunities as a whole.

Adopting Greek and International Practices:

1.Establish a National Vision on Food Waste Management: Armenia should develop a comprehensive national strategy similar to Greece's NWPP, focusing on the environmental, social, and economic aspects of food waste reduction. This strategy should include clear targets, such as reducing food waste by 30% by 2030.

2.Implement Economic Incentives for Food Donation: Following Greece's example, Armenia could introduce tax incentives to encourage businesses to donate excess food. This could be modelled after Greece's provision for a 20% tax reduction for food donations. Additionally, leveraging international funding sources such as the National Strategic Reference Framework and LIFE+ could support these initiatives.

3.Promote Public Awareness and Behavioral Change: Like Greece, Armenia should prioritize public awareness campaigns to educate households and the catering sector on sustainable food consumption and waste management practices. Collaboration with NGOs and civil society organizations can enhance these efforts. It could also involve promoting the activities of local companies that already utilize circular business models, such as the ORVAKO vermicomposting plant and the ISSD - Innovative Solutions for Sustainable Development of Communities NGO. These organizations should be integrated into public life, including school and university programs. Additionally, the government should establish decentralized training camps focused on food waste prevention and management, and ensure the participation of these organizations in such initiatives.

4.Develop Circular Economy Models: Armenia should adopt circular economy principles, particularly in public procurement processes related to the food industry and catering in institutions such as restaurants, kindergartens, hospitals, and elderly homes. Establishing a separate fund for circular economy projects, in collaboration with financial institutions and NGOs, can drive innovation and sustainability. Incorporating circular business concepts into start-up projects and mandating that existing food industry companies adopt efficient food management practices in accordance with the law should also be key priorities for the government.

Addressing Legislative Gaps:

1.Incorporate Waste Hierarchy and Circular Economy Definitions: The Armenian waste management legislation should include clear definitions and prioritize the waste hierarchy approach, addressing terms like biological waste, separate collection, high-quality recycling, and circular economy materials.

2.Mandate Waste Sorting: To improve waste management efficiency, Armenia should mandate waste sorting at the household,

enterprise, and food facility levels. This will ensure better resource utilization and align with international best practices.

3.Enhance Legal Framework for Waste Reduction Technologies: Armenia's existing incentives for waste reduction technologies need a clear legal framework outlining application and receipt processes.

This can help streamline the adoption of innovative waste management solutions.

Leveraging International Support:

1.Utilize European Union Support: In light of Armenia's potential EU membership and the European Commission's Resilience and Growth Plan, which includes a 270 million EUR investment, Armenia should prioritize reforms in sustainable development and optimal waste management.

2.Collaborate with European Partner Capitals: Building on the successful cooperation with European partner capitals, Armenia should expand its waste collection infrastructure, focusing on integrating food waste collection into circular economy models.

3.Implement Composting Programs: Expanding on the Yerevan

Municipality's composting pilot program, Armenia should develop a comprehensive bio-waste collection and composting model, involving public institutions and promoting organic waste processing.

Currently, the Republic of Armenia does not conduct research on food waste collection, its volume, causes, or the associated environmental and economic impacts.

Waste management, as defined in previous laws and the current government's vision, remains generalized and lacks specific segmentation for different types of waste and sanitation categories.

The issue of waste collection in both Yerevan and the provinces persists, with a significant portion of waste still being burned in open spaces, leading to environmental problems and inconveniencing nearby residents. International experience demonstrates that waste can be an economic resource or raw material.

Both legislative and educational efforts should prioritize the implementation of circular economy models.

At least a few organizations need to advocate for these models and encourage the government to make sustainable and circular decisions.

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